



HE UNITED STATES PATENT AND TRADEMARK OFFICE

Don Butler, et al.

Serial No.:

09/654,938

Filing Date:

May 10, 2000

Title:

Reduced Television Display Flicker And Perceived Line

Structure With Low Horizontal

Scan Rates

Examiner: Victor R. Kostak

Art Unit: 2611

March 21, 2003 San Francisco, California

Commissioner of Patents Washington, DC 20231

SUBMISSION OF FORMAL DRAWINGS

Sir:

Applicants submit herewith fifteen sheets of formal drawings for the allowed U.S. patent application captioned above.

The content of the enclosed formal drawings is identical to the content of the drawings originally filed with the application.

Respectfully submitted,

David N. Lathrop Reg. No. 34,655

601 California St., Suite 1111 San Francisco, CA 94108-2805

Telephone: (415) 989-8080 Facsimile: (415) 989-0910

Enc.

Certificate of Mailing Under 37 CFR 1.8

I certify that this Submission of Formal Drawings and any enclosed materials are being deposited with the United States Postal Service on March 21, 2003, with sufficient postage as first class mail in an envelope addressed to Commissioner for Patents, Box Issue Fee, Washington, DC 20231.

Docket: FAR009





Sheet 1 of 15
"Reduced relevision Display Flicker and Perceived Line Structure with Low Horizontal Scan Rates"

Inventors: Don Butler, et al. S/N: 09/654,938 (FAR009)

Contact: Gallagher & Lathrop 415-989-8080

1 / 15

6597402

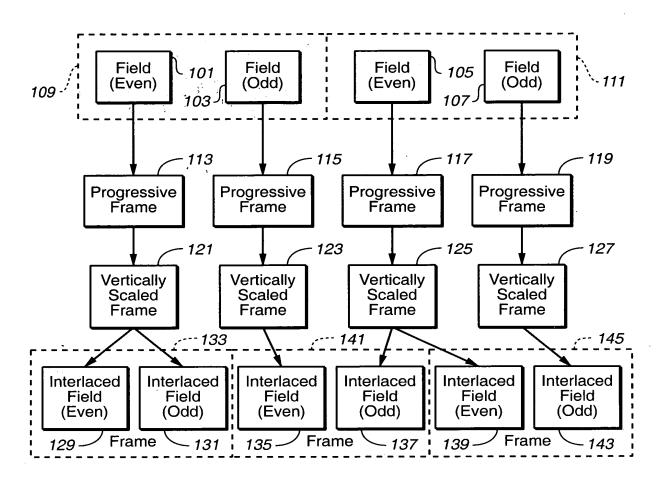


FIG._1



Sheet 2 of 15
"Reduced Television Display Flicker and Perceived Line Structure with Low Horizonta Scan Rates"
Inventors: Don Butler, et al.
S/N: 09/654,938 (FAR009)

Contact: Gallagher & Lathrop 415-989-8080

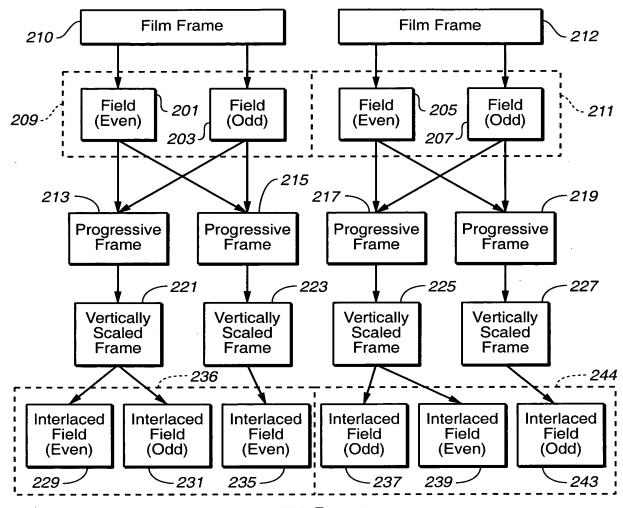
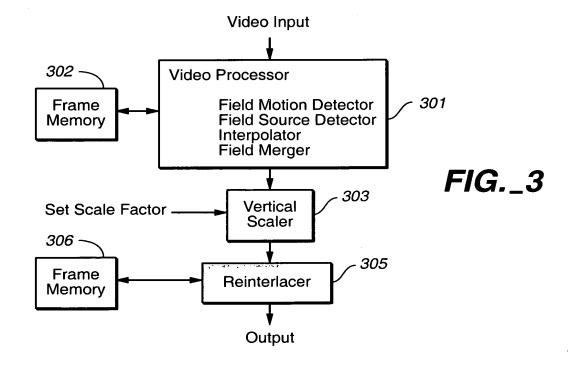


FIG._2





Sheet 3 of 15

"Reduced Television Display Flicker and Perceived Line Structure with Low Horizonta Scan Rates"

Inventors: Don Butler, et al.

S/N: 09/654,938 (FAR009)

Contact: Gallagher & Lathrop 415-989-8080 3/15 One Field Delay Two Field Delay Bo B_{o} \mathbf{B}_{e} $A_e + Z_o A_e + A_{eo} A_o + A_e A_o + A_{oe} B_e + A_o B_e + B_{eo} B_o + B_e B_o + B_{oe}$ Video Input $\mathbf{B}_{\mathbf{e}}$ Во Ŷ Ae, t В $\mathbf{B}_{\mathbf{e}}$ Po , Aeo **A** ${\sf B}_{\sf e}$ A A_{e} įζ Po A Zo

Œ)

0

<u>ග</u>

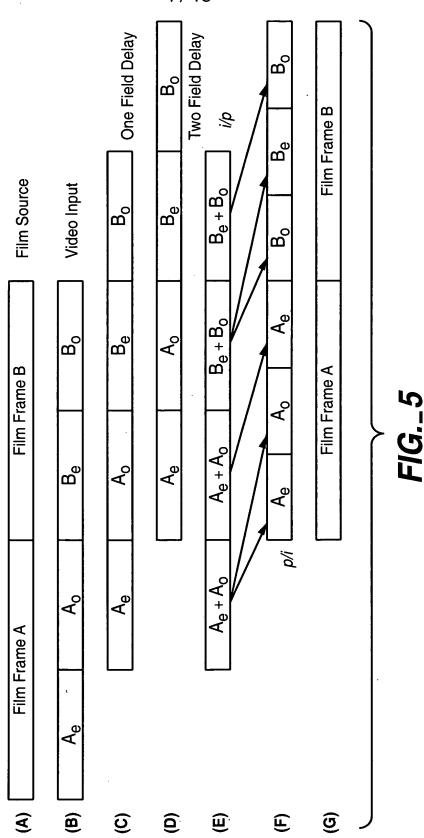
 A_e

3

<u>@</u>

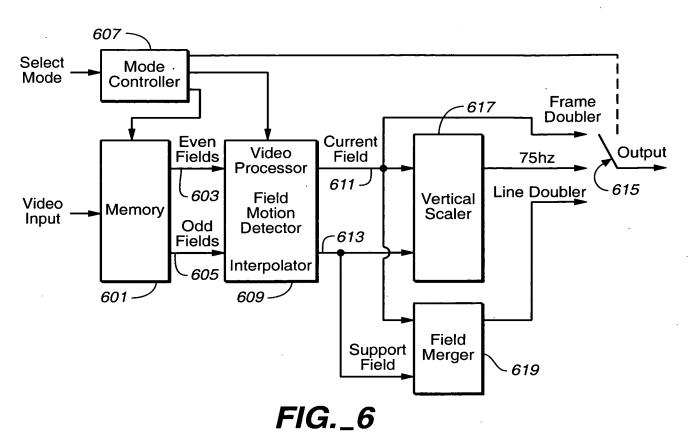


Sheet 4 of 15
"Reduced Television Display Flicker and Perceived Line Structure with Low Horizontal Scan Rates"
Inventors: Don Butler, et al.
S/N: 09/654,938 (FAR009)
Contact: Gallagher & Lathrop 415-989-8080

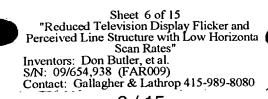




Sheet 5 of 15
"Reduced Television Display Flicker and
Perceived Line Structure with Low Horizonta Scan Rates"
Inventors: Don Butler, et al.
S/N: 09/654,938 (FAR009)
Contact: Gallagher & Lathrop 415-989-8080







Video Input	Stream 603	Stream 605	Current Field (no motion)	Support Field (no motion)	Current Field (full motion)	Support Field (full motion)	Current Field (mixed motion)	Support Field (mixed motion)	
		Co	ပိ	D _e	င်	Coe	Co	o De, Coe	
	ථ	ပိ	ပိ	ပိ	ပိ	Ceo	ပီ	C _o , C _{eo}	
ပိ	ථ	Во	Bo	ပိ	Во	B _{oe}	Во	C _e ,B _{oe}	ler Mode
ပီ	Be	Во	Be	Во	Be	Beo	Be	B _o , B _{eo}	Line Doubler Mode
Во	Be	Ao	Ao	В	Ao	A _{oe}	Ao	B _e , A _{oe}	
Ве	Ae	A	A _e	A	Ae	Aeo	Ae	A _o , A _{eo}	
Ao	Ae								
A _e									
€	(B	<u>©</u>	<u>Q</u>	(E	(F)	5	Ē	€	



Sheet 7 of 15

"Reduced Television Display Flicker and Perceived Line Structure with Low Horizon Scan Rates"

Inventors: Don Butler, et al.

S/N: 09/654,938 (FAR009)

Contact: Gallagher & Lathrop 415-989-8080

C _o D _e D _o Video Input	C _e C _e C _e C _e D _e D _e Stream 603	Bo Bo Co Co Co Co	B _o C _e C _o C _e C _o D _e Current Field (no motion)	Ceo Ce Co Coe Deo De (full motion)	B _o B _e B _e B _e C _{eo} C _e C _o C _e C _e C _e C _o D _{eo} D _e Current Field (mixed motion)	Mode
B _o C _e	A _e B _e B _e B _e B _e	A _o A _o A _o B _o B _o	A _e A _o B _e B _o B _e	A _{oe} B _{eo} B _e B _o B _{oe}	A _e A _{ce} A _o B _{co} B _e B _o B _o B _o	Frame Doubler Mode
A _e A _o B _e	A _e A _e A _e	Ao	Ao	Ao	A _o	
(A)	(B)	(C)	(D)	: (E)	(F)	



Sheet 8 of 15

"Reduced Television Display Flicker and Perceived Line Structure with Low Horizontal Scan Rates"

Inventors: Don Butler, et al.

S/N: 09/654,938 (FAR009)

Contact: Gallagher & Lathrop 415-989-8080

€	A _e	\mathbb{H}	Ao	Be		Во	ပီ		ပိ		De	Video Input
(B)				A	A _e A	A _e A _e	Be	B _e B _e	ပိ	ပီ	ပိ	Stream 603
<u>(</u>)					\ <u>A</u>	A _o A _o	A _o	B _o B _o	o Bo	ပိ	ပိ	Stream 605
<u>Q</u>					▼	A _e A _o	Be	B _o B _e	е Во	ပီ	ပိ	Current Field (no motion)
(E)					A	A _o A _e	A _o	B _e B _o	Ce	ပိ	င်္ခ	Support Field (no motion)
(F)		•			\\	A _e A _{eo}	A _{oe}	B _{eo} B _e	e B _o	ပီ	Ceo	Current Field (full motion)
9					ď	A _{eo} A _e	Ao	B _e B _{eo}	eo Boe	Ceo	ပိ	Support Field (full motion)
Œ					A	Ae AoAeo	Ao Ago Be Age Bo Bgo	B _{eo} B _e	В	ပ္	လိုင္ပ	Current Field (mixed motion)
€					P	A _o A _{so} A _e	A _o	B _e B _o B	B _o B _{so} C _e B _{so} C _o C _{so}	e င့်င်္	ပြီ	Support Field (mixed motion)
ر							75 Hz Mode	J ode				



Sheet 9 of 15
"Reduced Television Display Flicker and Perceived Line Structure with Low Horizonta Scan Rates"

Inventors: Don Butler, et al. S/N: 09/654,938 (FAR009) Contact: Gallagher & Lathrop 415-989-8080

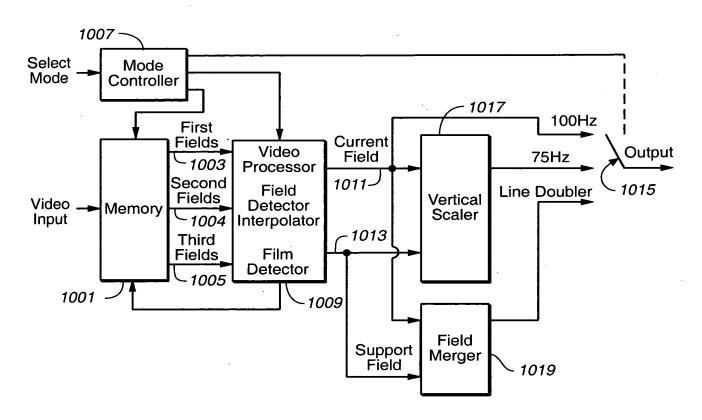


FIG._10



Sheet 10 of 15

"Reduced Television Display Flicker and Perceived Line Structure with Low Horizontal Scan Rates"

Inventors: Don Butler, et al. S/N: 09/654,938 (FAR009)

Contact: Gallagher & Lathrop 415-989-8080

Film Source	Input Video	Stream 1003	Stream 1004	Stream 1005	Current Field 1011	Support Field 1013			
Film A Film B Film C	A _e A _o B _e B _o C _e C _o	A _e A _e B _e B _e C _e C _e	A _o A _o B _o B _o C _o C _o	A _e A _e B _e B _e C _e C _e	A _e A _o B _e B _o C _e C _o	A _o A _e B _o B _e C _o C _e	Film A Film B Film C	Line Doubler Mode First Film Phase	
€	(B)	<u>(C</u>	<u>(a)</u>	(E)	(F)	5	Œ		



Sheet 11 of 15
"Reduced Television Display Flicker and Perceived Line Structure with Low Horizontal Scan Rates"
Inventors: Don Butler, et al.
S/N: 09/654,938 (FAR009)
Contact: Gallagher & Lathrop 415-989-8080

(B)	Line Doubler Mode Second Film Phase	>
-----	-------------------------------------	-------------



Sheet 12 of 15
"Reduced Television Display Flicker and Perceived Line Structure with Low Horizonta Scan Rates"
Inventors: Don Butler, et al.
S/N: 09/654,938 (FAR009)
Contact: Gallagher & Lathrop 415-989-8080

<u>(A</u>	Film A Film B Film C Film D	Film Source
(B)	Ae Ao Be Bo Ce Co De Do	Input Video
(0)	AeAeAeBeBeBeBeCeCeCeCeDeDe	Stream 1003
(Q)	AolAolAolBoBoBoBolBolColColCo	Stream 1004
(E)	AeAeAeBeBeBeBeCeCe	Stream 1005
(F)	A _e lA _o lB _e lB _o lB _e lB _o lC _e lC _o lC _e lC _o	Current Field
(5)	A _o lA _e lB _o lB _e lB _o lB _e lC _o lC _e C _o lC _e	Support Field
Ð	Film B Film C	
,	Frame Doubler Mode First Film Phase	



Sheet 13 of 15

"Reduced Television Display Flicker and Perceived Line Structure with Low Horizontal Scan Rates"

Inventors: Don Butler, et al. S/N: 09/654,938 (FAR009)

Contact: Gallagher & Lathrop 415-989-8080

Film Source	Input Video	Stream 1003	Stream 1004	Stream 1005	Modified Stream 1005	Current Field	Support Field			
Film A Film B	Ae Ao Be Bo Ce Co	[Ae Ae Ae Be Be Be Ce Ce	A _o A _o A _o A _o B _o B _o B _o B _o	Ae Ae Ae Ae Be Be Be Be	A _o A _o A _o A _o B _o B _o B _o B _o B	A _o B _e A _o B _e B _o C _e B _o C _e	AeBoAeBoBeCoBeCo	Film A Film B	Frame Doubler Mode Second Film Phase	
(A)	(B)	(C)	(Q)	(E)	(F)	(5)	£	(۔	



Sheet 14 of 15
"Reduced Television Display Flicker and Perceived Line Structure with Low Horizontal Scan Rates"
Inventors: Don Butler, et al.
S/N: 09/654,938 (FAR009)
Contact: Gallagher & Lathrop 415-989-8080

) Film A Film B Film C Film D Film Source) A _e A _o B _e B _o C _e C _o D _e D _o Input Video) Ae Ae Be Be Be Ce Ce Ce De Stream 1003)) Stream 1004	(A _e A _e B _e B _e C _e C _e Stream 1005	(Ae Ao Ae Bo Be Bo Ce Co Ce	(Ao Ae Ao Be Bo Be Co Ce Co) Film A Film B Film C	75 Hz Mode First Film Phase	
(A)	(B)	<u>(C</u>	<u>(D</u>	(E)	(F)	(5)	Œ		



Sheet 15 of 15
"Reduced Television Display Flicker and
Perceived Line Structure with Low Horizonta
Scan Rates"
Inventors: Don Butler, et al.
S/N: 09/654,938 (FAR009)
Contact: Gallagher & Lathrop 415-989-8080

Film Source	Input Video	Stream 1003	Stream 1004	Stream 1005	Modified Stream 1005	Current Field	Support Field		
Film A Film B Film C	Ae Ao Be Bo Ce Co De Do	$A_e A_e B_e B_e B_e C_e C_e D_e$	Ao Ao Ao Bo Bo Bo Co Co Co	$A_e A_e A_e B_e B_e C_e C_e$	Ao Ao Ao Bo Bo Bo Co	$A_o B_e A_o C_e B_o C_e C_o$	$B_e A_o B_e B_o C_e B_o D_e$	Film A Film B	Second Film Phase
(A)	(B)	<u>©</u>	(Q)	(E)	(F)	9	(H)	€	J